

CLAIMS

1. A resource arbitration system, comprising:
 - a plurality of agents selectively coupled to a resource; and
 - an arbitration controller adapted to monitor said resource used by each agent and
- 5 adapted to calculate an optimal usage of said resource for each agent and generate grant control signals to each agent to couple said agents to said resource based on said calculated optimal usage for each said agent.
2. A resource arbitration process comprising the steps of:
 - fixing an arbitration for a plurality of agents sharing a resource;
 - 10 determining the demand for each agent by skewing arbitration priority to the particular agent;
 - correlating the demands for each agent for a predetermined duration; and
 - assigning resource arbitration priority to each agent based on the historical ratio of the demand for each agent over the sum of the demands of all agents.
- 15 3. A resource arbitration process as claimed in claim 2, further comprising the step of applying statistical techniques to the correlated data to determine a mean demand for each agent.
4. A resource arbitration process as claimed in claim 2, further comprising the step of repeating the process of determining the demand, correlating the demands and
- 20 assigning resource arbitration.
5. A bus arbitration system, comprising:
 - a plurality of bus agents selectively coupled to a bus; and

an arbitration controller adapted to monitor said bus used by each bus agent and adapted to calculate an optimal usage of said bus for each bus agent and generate grant control signals to each bus agent to couple said bus agents to said bus based on said calculated optimal usage for each said bus agent.

5 6. A bus arbitration system as claimed in claim 5, wherein said bus is a PCI bus and said bus agents are PCI agents.

7. A bus arbitration system as claimed in claim 5, said arbitration controller comprising a bus monitor consisting of logic which monitors some or all of bus transactions for each said bus agent; and programmable bus arbitration logic comprising
10 priority assignment registers for each bus agent and logic to generate said grant control signals based on the data stored in said priority assignment registers.

8. A bus arbitration system as claimed in claim 7, wherein said bus monitor calculates the bus effective bandwidth for each transaction of each said bus agent, and stores the running average for each bus agent in bandwidth registers.

15 9. A bus arbitration system as claimed in claim 7, wherein said programmable bus arbitration logic decodes said priority assignment registers for each bus agent and assigns each agent a number of grant control signals based on the value in its respective priority assignment register.

10. A resource arbitration process comprising the steps of:
20 fixing an arbitration of each agent sharing a resource;
skewing priority to an agent for a fixed interval;
monitoring resource usage of said agent having priority;

creating a table of resource requirements for each agent during said fixed interval;

and

assigning resource priority to each agent based on said table of resource requirements.

- 5 11. A resource arbitration process as claimed in claim 10, further comprising the steps of:

correlating resource requirements for each agent over a specified period of time;

and

- 10 statistically removing aberrations from said data and determining a mean resource requirement for each agent.